

REMARKS

This Amendment, filed in reply to the Office Action dated December 29, 2005, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-21 remain pending the application. Claims 1-3 and 5-21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kishida (U.S.P. 5,287,418) in view of Takeo (U.S.P. 5,796,870, assigned to Fuji Photo Film). Claim 4 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kishida in view of Takeo and well-known prior art. Applicant respectfully submits the following arguments in traversal of the prior art rejections.

As an initial matter, the Examiner indicated that prior comments regarding whether expansion or compression characteristics are preliminarily set were not persuasive. Applicant does not necessarily concede to the Examiner's interpretation of the term "characteristic" and that the Examiner's comment is unnecessary in view of the new rejection based on additionally recited subject matter.

With regard to the rejection under 35 U.S.C. § 103, Applicant submits the following arguments. Applicant's invention relates to a process and apparatus to provide adequate contrast in an image. Details of the background and exemplary embodiment of the invention are set forth in the November 29, 2004 Amendment at pages 9-10. Applicant refers the Examiner to these descriptions. Applicant emphasizes that conventionally known processes use image data analysis to determine appropriate adequate compression and expansion. However, this requires a

long time to process the image data in view of the required data analysis. The present invention obviates this deficiency by preliminarily setting compression and expansion characteristics and selecting from this preliminary set of information. In an exemplary embodiment, luminance data undergoes low pass filtering and the processed through an LUT for setting characteristics.

Turning to the newly cited art, Kishida includes a set of reference tone curves which become differently weighted to provide gradation conversion. The tone curves are determined on a color by color basis. Col. 4, lines 38-42.

Takeo includes image compression and expansion that operates analogously to the conventionally known device, in that the expression and expansion rely on processing of the image data to provide adequate dynamic range. Takeo notes that dynamic range compression of each picture element changes with each picture element according to an equation: $D_{proc} = D_{org} + f(Lu)$, where Lu represents the mean value of all pixels located within a unsharp mask element. The process requires individual consideration of each pixel in order to provide the image quality sought by the reference. The processing is performed on monochrome data.

The Examiner contends that the combination of Kishida and Takeo teaches each feature of claim 1. The Examiner correctly concedes that Kishida does not teach basic compression or expansion coefficients as gradation coefficients but cites Takeo to make up for this deficiency. Applicant submits that the rejection is improper for at least the following reasons.

As an initial matter, the modification that the Examiner seeks to make is improper. The Examiner contends that both references relate to gradation conversion, and thus it would be

obvious to use expansion and compression as set forth by Takeo to expand the dynamic range as a form of gradation conversion as in Kishida. The Examiner then further contends that it would be obvious to provide preliminarily set conversion based on the gradation conversion in Kishida. The Examiner's starting point assumes that both references relate to gradation conversion. However, the form of gradation conversion of Kishida relates to tone conversion, such as the color signals scanned in using a scanner. The tone reference curves relate to types of images such as high key or low key images or portraits, machines, or landscapes. Here, color reproduction comprises the significant parameter. By contrast, Takeo relates to an x-ray imaging device, of monochrome nature, whereby high and low spatial frequency information must be represented accurately. Takeo, col. 2, lines 41-53. The type of processing of each reference relate to fundamentally different characteristics.

Relatedly, Kishida is able to generate preliminary tone curves based on a type of image. However, in Takeo, pixel information must be individually processed in order to provide the correct dynamic range for a particular image. This type of information in an x-ray analysis cannot be *a priori* known in comparison to the general imaging classification (landscape, high key, low key or portrait) provided by Kishida. There is no motivation to combine the tone processing further with a dynamic range analysis because the color analysis would become too complicated since several different colors interact to provide the correct tone. Therefore, contrary to the Examiner's contention, the references may not be properly combined.

Assuming *arguendo* that Kishida and Takeo may be combined, their combination does not teach each feature of claim 1. To the extent that each reference teaches gradation conversion,

claim 1 specifies that it is the expansion or compression ratio that is preliminarily set. Kishida is conceded to lack this feature. Takeo teaches the expansion and conversion, but it is not preliminarily set and cannot be preliminarily set for the reasons detailed above. If the references are combined, their combination will teach preset tone curves, and expansion and compression that is not preliminarily set. There is no reason to combine the tone curve processing and the dynamic range processing in the manner that the Examiner suggests since no apparent benefit would result. Therefore, claim 1 is patentable for at least this reason. Claims 10-12 are patentable for analogous reasons and the remaining claims are patentable based on their dependency.

In addition, the combined teachings cannot be applied to dynamic range compression (expansion) processes for low pass filtered luminance data, as Kishida teaches tone conversion, and Takeo cannot sacrifice such filtering.

With regard to claim 4, the Examiner contends that different film sizes are well-known in the art. In view of the new rejection and the fact that the Examiner has re-raised this issue that Applicant may timely challenge the citation of Official Notice or well-known prior art. Applicant submits that even if the film sizes are known, there is no motivation to process the expansion or compression based on the recited film sizes or film types. As amended, claim 4 also recites characteristics representing input and output relationships of luminance data and preliminarily set compression or expansion based original type and size. Therefore, claim 4 is patentable for this additional reason. Amended claim 15 is patentable for analogous reasons.

Claims 22-23 are added to describe features of the invention more particularly.

With regard to claims 20-21, the Examiner refers to $f_1(x)$, $f_d(x)$ in Fig.3 of Kishida, concerning the relationship of the upper level side and lower level side of a predetermined level for an input value, as analogous to input/output image relationships of these claims. However, $f_1(x)$, $f_d(x)$ are functions of upper level and lower level for an output value level. Thus, $f_1(x)$, $f_d(x)$ differ from basic compression (expansion) characteristics defining upper level side (right side of Y_c of Fig.6A-6D) and a lower level side(left side of Y_c of Fig.6A--6D) of a predetermined level (Y_c of present Fig.6A-6D) for an input value recited in claim 20. The Examiner seems to misunderstand this point. Thus the object of cascade in claim 21, differs from $f_1(x)$, $f_2(x)$ as indicated by the Examiner. In the present application, it is the cascade of the characteristics of Fig. 6A and the characteristics of Fig.6C, for example.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


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